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Appl. No.:10/629,024
Atty. Dkt. No.:10003513-2

REMARKS

In view of the following remarks, the Examiner is requested to withdraw the rejections and allow Claims 17 and 19-35, the only claims pending and currently under examination in this application.

In the above amendments, Claim 17 is amended to include the limitation described in Claim 18, an Claim 18 has correspondingly been cancelled. Supporting information for this amendment is found in the specification section at p. 4, lines 15-19. As such, no new information is added by way of this amendment.

Claim Rejections - 35 USC § 102

Claims 17, 18, 20-23, 25, 26, 28, 29-31, 33-34 are rejected under 35 U.S.C. 102 (a or e) as being anticipated by Gamble et al. (US Patent No. 6,001,309).

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Both Claim 17 and Claim 29 include the element of depositing of at least one set of drops from a corresponding same dispenser onto a substrate for each of multiple sets of neighboring features, so as to form the array with the feature sets formed from drops deposited by respective different dispensers, wherein a distance between at least two neighboring sets of features is greater than an average distance between features within the sets, both as measured in a same direction.

These claimed elements can be seen in the embodiment of the invention shown in Figure 4 as copied below, which depicts a top view of the dispensers to the left and the deposited neighboring features on the right:

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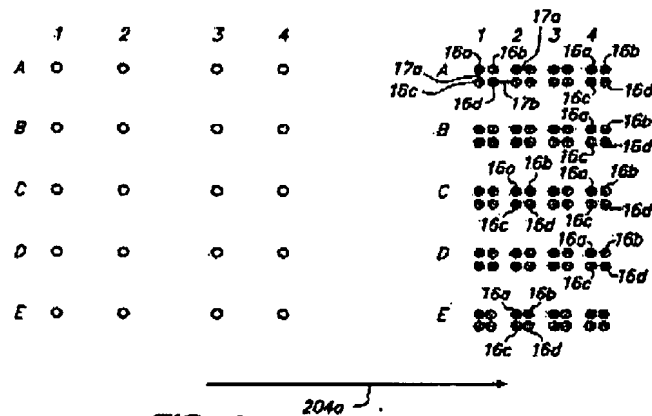


FIG. 4

As illustrated in Figure 4, the set of four neighboring features (16a, 16b, 16c, 16d) in region A1 (right-side) is deposited from dispenser A1 (left-side). The set of neighboring features in region A1 (right-side) is entirely different from the set of neighboring features in region A2, which was deposited from dispenser A2 (left-side). The features within the set in region A1 were deposited from a corresponding same dispenser, which was dispenser A1. The features within the set in region A2, were deposited from a corresponding same dispenser, which was dispenser A2.

Figure 4 illustrates the element of Claim 17 and Claim 29 which states that "a distance between at least two neighboring sets of features is greater than an average distance between features within the sets, both as measured in a same direction." The distance between two neighboring sets of features is represented by line 17b which connects feature 16d of region A1 with feature 16c of region A2. The distance between features within the sets is represented by line 17a which connects features 16a and 16b of region A2. As claimed, line 17b is greater than line 17a which is measured in the same direction.

Figure 4 also illustrates the element of Claim 17 and Claim 29 which describes the formation of "an array with sets formed from drops deposited by respective different dispensers." The set of neighboring features in region A1 (right-side) is formed from a different dispenser than the set of neighboring features in region A2 (right-side). The corresponding same dispenser, A1 (left-side), that

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deposited the set of neighboring features in region A1 (right-side), is a different dispenser than the dispenser, A2 (left-side), that deposited the set of neighboring features in region A2 (right-side). Therefore, Figure 4 illustrates that the set of features in region A1 was formed from a different dispenser, A1, than the dispenser, A2, used to form the set of features in region A2.

In maintaining the rejection, the Examiner alleges that Gamble et al. teach 2-3x spot redundancy (column 12, lines 26-28), representing a type of neighboring feature set, comprised of neighboring identical deposited drops, as mentioned in the Office Action date April 5, 2006 on page 5, first paragraph.

Column 12, lines 26-28 of Gamble et al. reads verbatim as follows: "There is, however, an advantage to include 2-3x redundancy in favor of accuracy and reliability. Also, as to the number of individual samples which are spotted in the array."

The 2-3x redundancy, described by Gamble et al., does not teach the deposition of neighboring sets of features as claimed. The above quoted citation (column 12, lines 26-28) is found within the discussion of the storage subsystem 300 which begins at column 11, line 37. The redundancy that Gamble et al. refer to is clarified as the deposition of multiple copies of individual spots. Gamble et al. state that "by using jets formed in arrays, tremendous time savings can be achieved, which allow for the production of large numbers of spot arrays, each spot array having a large number of individual spots in a predesigned distribution." (Column 13, lines 28-31).

Gamble et al. twice claim a uniform spacing between deposited spots. In Claim 6, Gamble et al. describe a "means for connecting said heating element to a control system, whereby droplets capable of providing arrays of spots less than 500 microns from center to center with substantially no contamination of one spot with another". In Claim 9, Gamble et al. also describe a "means for connecting said piezoelectric transducer to a control system; whereby droplets capable of providing arrays of spots of less than 500 microns from center to center with substantially no

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contamination of one spot with another". Claims 6 and 9 of Gamble et al. suggest a uniform spacing between features. In the specification section, Gamble et al. describe a particular embodiment that comprises spots with a uniform inter-spot distance. "The chip size is set at 2cmx2cm each containing a 1cmx1cm array (spot-to-spot distance is 100 microns)" (Column 13, lines 37-39).

Therefore, if Gamble teaches anything about the feature arrangement on the substrate, it is that the features are uniformly spaced on the substrate.

In contrast, the neighboring sets of features as claimed are such that the distance between at least two neighboring sets of features is greater than an average distance between features within the sets, both as measured in the same direction. Neighboring features are spatially closer to their respective neighboring features than they are to features of another set of neighboring features.

Gamble et al. teach a uniform spacing between deposited spots. As such, Gamble et al. does not teach this element of Claim 17 and Claim 29 in the present case.

Furthermore, as pointed in the Applicant's prior response, Gamble et al. fails to anticipate the claims in the present case because Gamble et al. do not teach one jet depositing "neighboring" drops onto a substrate, let alone multiple sets of neighboring features as described in the present invention (p. 7, third paragraph).

The Examiner alleges that Gamble et al. teach the preparation of 5 x 5 neighboring feature sets as part of a 7 x 5 larger array in figure 6, as described in the Office Action date April 5, 2006 on p. 6, first paragraph.

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Figure 6 of Gamble et al. is as follows:

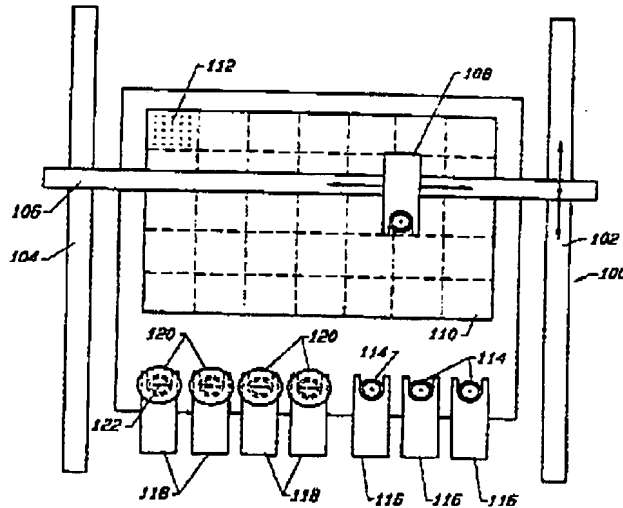


FIG. 6

Gamble et al. clarifies figure 6 beginning at column 9, line 37 and continuing to column 10, line 24. Gamble et al. states that "during operation, each jetting device in turn may provide for a plurality of spots of the same reagent at different sites on the substrate, so that each portion of the substrate has the same reagent at comparable places at each array." (Column 10, lines 2-6).

As claimed, neighboring features are those features deposited from a corresponding same dispenser. Gamble et al. do not state that the spots in the 5 x 5 set of spots in Figure 6 are deposited from the corresponding same dispenser. The 5 x 5 array in Figure 6 of Gamble et al. is not a set of neighboring features formed by a corresponding same dispenser according to Claim 17 and Claim 29 in the present case. As such, Gamble et al. do not teach this element of the claims.

In sum Gamble et al. fail to teach the claimed elements of:

(a) deposition of at least one set of drops from a corresponding same dispenser onto a substrate for each of multiple sets of neighboring features, so as to form the array with the feature sets formed from drops deposited by respective different dispensers, wherein

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(b) a distance between at least two neighboring sets of features is greater than an average distance between features within the sets.

Because Gamble et al. fail to teach all of the elements of the subject claims, Claims 17, 20-23, 25, 26, 28, 29-31, 33-34 are not anticipated by 35 U.S.C. 102 (a or e), and this rejection may be withdrawn.

Claims 17, 18, 21, 26, 29, 30, 34 were rejected under 35 U.S.C. 102(b) as being anticipated by Baldeschwieler et al. (US Patent No. 5,847,105 - IDS entry 2/21/2006)

In maintaining this rejection, the Examiner notes, in reference to a raster approach towards synthesizing oligonucleotides, that Baldeschwieler et al. states at column 6, lines 55-58, "the simplest design to accomplish this is a five jet system, one jet each for the four phosphoramidite reagents and one jet for the activating tetrazole solution." The Examiner contends that in synthesizing the oligonucleotides AAAA next to TTTT next to CCCC next to GGGG as "neighboring features," each tetranucleotide would effectively be assigned its own dispenser jet, and provide drops deposited by respective different dispensers. Applicants respectfully disagree with the Examiner's stated position.

Baldeschweiler et al. states in the same paragraph as the above quoted citation that "the tetrazole jet fires at every address position." (Column 7, lines 10-11). Therefore, each of the tetranucleotides proposed by the Examiner would be produced by the action of at least two dispensing jets. One of these jets, the tetrazole jet, would be commonly used for all of the proposed tetranucleotides.

As such, Baldeschweiler et al. fail to teach the element of the claims that the feature sets are formed from drops deposited by respective different dispensers.

Furthermore, the neighboring sets of features as claimed are such that the distance between at least two neighboring sets of features is greater than an average distance between features within the sets, both as measured in the same

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direction. Neighboring features are spatially closer to their respective neighboring features than they are to features of another set of neighboring features.

Baldeschweiler et al. are silent with respect to whether the distance between at least two sets of features is greater than an average distance between features within the set, both as measured in the same direction. As such, Baldeschweiler et al. fail to teach this element of the subject claims.

Because Baldeschweiler et al. fails to teach all of the elements of the subject claims, Claims 17, 21, 26, 29, 30, 34 are not anticipated under 35 U.S.C. 102(b) by Baldeschweiler et al. and this rejection may be withdrawn.

Maintained Claim Rejections - 35 USC § 103

Claims 17, 18, 20-23, 25, 26, 28, 29-31, 33-34 and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Gamble et al. (US Patent No. 6,001,309) in view of Suovaniemi et al. (US Patent No. 4,215,092).

As reviewed above, Gamble fails to teach at least the claimed element of the distance between at least two neighboring sets of features is greater than an average distance between features within the sets, both as measured in the same direction.

Furthermore, Gamble et al. fail to suggest this element because Gamble suggests uniform feature spacing. Claims 6 and 9 of Gamble et al. and the embodiment described by Gamble et al. at Column 13, lines 37-39 suggest a uniform spacing between deposited spots. Gamble et al. further suggest in the abstract a uniform spacing between deposited spots: "droplets can be formed on a surface, separated by as little as 80 microns center-to-center."

Accordingly, Gamble fails to teach or suggest at least the claim element of the distance between at least two neighboring sets of features is greater than an

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average distance between features within the sets, both as measured in the same direction.

Because Suovaniemi was cited solely for teaching a multi-channel pipette, Suovaniemi fails to make up for this fundamental deficiency in Gamble.

Accordingly, Claims 17, 20-23, 25, 26, 28, 29-31, 33-34 and 19 are not obvious under 35 U.S.C. 103(a) over Gamble in view of Suovaniemi and this rejection may be withdrawn.

Claim 27 was rejected under 35 U.S.C. 103(a) as being unpatentable over Gamble et al. (US Patent No. 6,001,309) in view of Suovaniemi et al. (US Patent No. 4,215,092) as applied to Claims 17, 20-23, 25, 26, 28, 29-31, 33-34 and 19 above, and further in view of Quinn et al. (US Patent No. 4,685,998). As reviewed above, Gamble et al. in view of Suovaniemi et al. is fundamentally deficient in that these references fails to teach or suggest at least the element of the distance between at least two neighboring sets of features is greater than an average distance between features within the sets, both as measured in the same direction.

Because Quinn et al. was cited solely for teaching a wafer (functionally equivalent to a large substrate) in which a saw and punch-out device is used to extract "dice" (a.k.a. chips), Quinn et al. fails to make up for the fundamental deficiency of Gamble et al. in view of Suovaniemi et al.

Accordingly Claim 27 is not obvious under 35 U.S.C. 103(a) over Gamble in view of Suovaniemi et al. and further in view of Quinn and this rejection may be withdrawn.

New Claim Rejections - 35 USC § 103

Claims 17, 18, 21, 26, 29, 30, 34, and 24, 32, 35 were rejected under 35. U.S.C. 103 (a) as being unpatentable over Baldeschweiler et al. (US Patent No. 5,847,107) in view of Bass (US Patent No. 6,420,180).

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As stated above, Baldeschweiler et al. fails to teach at least the claimed element of the distance between at least two neighboring sets of features is greater than an average distance between features within the sets, both as measured in the same direction.

Furthermore, Baldeschweiler et al. fail to suggest this element because Baldeschweiler et al. are silent with respect to the deposition of neighboring features as claimed in the present case. As such, Baldeschweiler et al. fail to suggest the deposition of neighboring features as claimed in the present case.

Because Bass was cited solely for teaching a manner of compensating for displacement errors, Bass fails to make up for this fundamental deficiency Baldeschweiler et al.

Accordingly, Claims 17, 21, 26, 29, 30, 34, and 24, 32, 35 are not obvious under 35 U.S.C. § 103(a) over Baldeschweiler et al. in view of Bass and this rejection may be withdrawn.

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CONCLUSION

In view of the remarks above, the Applicants respectfully submit that all of the Claims are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, please telephone Bret Field at (650) 327-3400.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16 and 1.17 which may be required by this paper, or to credit any overpayment, to Deposit Account No. 50-1078.

Respectfully submitted,

Date: August 2, 2007

By: 

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